

8.16 Paleontological Resources

Paleontological resources are the mineralized (fossilized) remains of prehistoric plant and animal organisms, as well as the mineralized impressions (trace fossils) left as indirect evidence of the form and activity of such organisms. These resources are considered to be nonrenewable resources significant to our culture under state and federal law.

In compliance with California Energy Commission (CEC) Guidelines and *Rules of Practice and Procedure & Power Plant Site Certification Regulations* (CEC, 1997), the paleontological analysis provided herein assesses whether significant paleontological resources exist in areas that could be adversely affected by the Tracy Peaker Project (TPP). Measures are proposed to mitigate potential adverse effects of the project to any significant resources that may be present.

Laws, ordinances, regulations, and standards (LORS) pertinent to the identification, assessment of significance, and assessment and mitigation of adverse effects to paleontological resources are identified in Section 8.16.4.

This paleontological analysis also complies with guidelines and significance criteria issued in 1994 by the Society for Vertebrate Paleontology, a national professional organization. These criteria outline acceptable practices in the conduct of paleontological resource surveys, data recovery, analysis, and curation. The paleontological resources assessment for this project was carried out by, or under the direct supervision of, Mr. David Lawler, a qualified paleontologist.

This section summarizes the technical report, which is presented as Appendix H (Lawler, 2001). The technical report, which contains sensitive resource location information, has been filed under separate cover with the CEC with a request for confidentiality.

In 1978, the U.S. Department of the Interior, Bureau of Land Management proposed the following guidelines to determine the significance of a paleontological resource. A significant paleontological resource is one that:

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- Provides important information on evolutionary trends, relating living organisms to extinct organisms;
- Provides important information pertaining to biological community development and zoological/botanical biota interaction;
- Demonstrates unusual circumstances in biotic history; or
- Is of limited sample size, in danger of depletion or destruction by natural processes, vandalism, or commercial exploitation, or is found in no other geographic location.

In addition, all vertebrate fossils are categorized as being of significant scientific value, in keeping with the significance criteria of the Society for Vertebrate Paleontology (1994). Under California Environmental Quality Act (CEQA) Guidelines, a significant effect on paleontological resources can occur when a proposed project will “directly or indirectly destroy...a unique paleontological resource.”

Paleontological resources are classified as a nonrenewable scientific-cultural resource and are protected most notably by the 1906 Federal Antiquities Act and other subsequent federal legislation and policies and CEQA environmental provisions. Significant paleontological resources are defined in this report to include the interpretation outlined by the Society for Vertebrate Paleontology (1994), wherein vertebrate fossils are considered significant.

8.16.1 Affected Environment

8.16.1.1 Overview

GWF Energy LLC proposes to build and operate the Tracy Peaker Project (TPP), a nominal 169-megawatt (MW) simple-cycle power plant, on a nine-acre, fenced site within a 40-acre parcel in an unincorporated portion of San Joaquin County. The site is located immediately southwest of Tracy, California, and approximately 20 miles southwest of Stockton, California. The TPP would consist of the power plant, an onsite 230-kilovolt (kV) switchyard, an approximately five-mile, 230-kV electric transmission line, an approximately 1,470-foot water supply pipeline (as measured from the fence line), an onsite natural gas supply interconnection, and improvements to an existing dirt access road approximately one mile in

length. An approximately 5.2-acre area west of the plant fence line and within the 40-acre parcel would be used for construction laydown and parking. Figure 8.16-1 shows the regional location of the GWF site. Figure 8.16-2 shows the immediate site location of the GWF project, including the location of the proposed generating facility and the proposed transmission, water supply, and access routes. The topography is very flat in the area of the TPP in the San Joaquin Valley; however, the region is bordered by the southern Sierra Nevada foothills, which are prominent, erosion-resistant landforms in the project region (Bartow, 1991).

The northern San Joaquin Valley region contains a diverse record of geologic and biologic history that spans more than 30 million years, dating from the Miocene period. Fossils of marine and terrestrial organisms have accumulated to produce a significant record of prehistoric life, based on the Tertiary- and Quaternary-age deposition of sedimentary sequences. Regional tectonic events ranging from creation of the Tertiary-age marine basins to uplift of the southern Sierra Nevada foothill region, as well as fluctuating worldwide sea level changes, have significantly affected the geologic setting of the region.

Much of the paleontological interest in the project vicinity stems from the well-known discoveries of Pleistocene-age fossil vertebrate faunas derived from undifferentiated Quaternary-age units in other parts of northern and southern California, particularly the San Francisco Bay region. Scientific description of these fossil vertebrate assemblages provides one of the best-known records of Pleistocene faunas in California (see Miller, 1971; Stirton, 1939, 1951; Savage, 1951; Wolf, 1971, 1973, 1975; and Jefferson, 1991). Abundant continental and lacustrine (freshwater) deposits have provided favorable conditions for preserving vertebrate fossil remains in these geologic units.

8.16.1.2 Paleontological Literature and Locality Records Review

Data for the following descriptions of paleontological resources within the proposed project area were obtained from published records of previous geologic and paleontological investigations, unpublished paleontological research papers, museum records, and interviews conducted with individuals who have first-hand knowledge of resources within the project vicinity. These sources are referenced in Section 8.16.5.

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Sources consulted on the general geology of the area included regional geologic maps compiled by the California Division of Mines and Geology (CDMG) and the U.S. Geological Survey (USGS). More specific geologic information was obtained from 1:24,000- to 1:65,000-scale USGS and CDMG geologic maps.

Fossil locality records were reviewed and fossil specimens inspected (when possible) at the University of California Museum of Paleontology (UCMP), which provided most of the data concerning distribution of known fossil resources.

From May–July, 2001, collected data were reviewed to assess the potential for each geologic unit to contain significant paleontological resources and to determine appropriate field survey coverage.

8.16.1.3 Overview of Lithologic Units

Surficial sedimentary units of predominantly Pleistocene and Holocene to Recent age underlie the entire project area. These sediments include deposition that ranges from continental alluvial, fluvial, lacustrine, fan-derived sediments to subaerial floodplain deposits. Lithologies include sand, gravel, silt, and clay, all of which can be favorable to the preservation of paleontological resources.

Rock outcrops of Pleistocene age occur as surficial and subsurface deposits along the east side of the San Joaquin Valley area. These sedimentary units have been described and mapped previously by Bartow (1991), CDMG (1966), Croft (1969), and Marchand and Allwardt (1981).

Major alluvial fan deposits originated along the range front on the west side of the San Joaquin Valley and have flowed westward (CDMG, 1966).

The Quaternary rock units vary in facies type from sandstones to unconsolidated siltstone and clays, all of which are either fossiliferous or potentially fossiliferous.

Gradual, long-term erosion and previous construction activity have removed parts of the recent soil cover, so that these Quaternary rock units and their contained fossils are now at or near the surface throughout most of the project area. However, these formations or parts of

the formations are obscured in most areas by soil, vegetation, or thin deposits of surficial sediment. Thus, visual detection of fossils is possible in those areas where natural erosion or man-made excavations (during road, pipeline, or building site excavation or grading operations) have removed this cover.

Portions of the proposed project area appear overlain by shallow, imported fill material. Given this fact, the potential paleontological sensitivity of undisturbed portions of the project site has been determined from the distribution of known vertebrate fossil localities in the region, and available geological mapping of the Quaternary alluvium (*Qal*).

Cenozoic Rock Units

Neroly Formation (Tn). The Neroly Formation, which is regarded as a late Tertiary unit (Miocene age), outcrops along the west side of the northern San Joaquin Valley (Dibblee, 1980). It is the oldest sedimentary unit within the project area. It is characterized as nonmarine sandstone, blue to gray in color, and locally contains conglomerate lenses. Stirton (1939) described a vertebrate fauna from the Hospital Creek area of southern Stanislaus County. Geologic contacts are designated as *Tn* on Map 1, and the paleontological sensitivity is rated as high.

Tertiary Formation (Tps). Dibblee (1980) mapped a series of nonmarine sedimentary rocks as *Tps* along the west side of the northern San Joaquin Valley. This Pliocene-age rock unit contains greenish-gray clay and lenses of conglomerate, sandstone, and marl. This unit correlates with similar Tertiary-age sedimentary units in the Mt. Diablo area that contain vertebrate faunas described by Stirton (1939) and Savage (1951). This unit is assigned a high paleontological sensitivity.

Quaternary Alluvium Deposits (Qal). While Quaternary alluvium deposits of Pleistocene age occur locally within the proposed project area, usage of the *Qal/Qu* designation on available geologic maps of the TPP–northern San Joaquin Valley region is highly variable. Geologic units ranging from Quaternary-age

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stream, terrace, fluvial, and alluvial fan and floodplain deposits may be grouped under this designation, particularly where geologic data have been scarce due to industrial or agricultural development.

These units outcrop extensively in the TPP–northern San Joaquin Valley region. Bartow (1987, 1991) and Marchand and Allwardt (1981) noted that these geological units may exceed several hundred feet in thickness and consist of poorly consolidated, coarse sands and gravels, silts, and clay units.

There are no known paleontological sites within one-quarter mile of the proposed project area. The closest known vertebrate fossil locality is roughly three miles southeast of the proposed plant site and is designated as UCMP V66150. See confidential Attachment H(A)1 in Appendix H for more information. A scientifically important gravel quarry at this location yielded a large fossil mammal limb bone.

Paleontological resources have not been documented in rock units within a one-quarter-mile radius of the proposed project area, but three paleontological localities have been discovered within a 10-mile radius of the project. These localities contain scientifically important paleontological resources that represent a wide variety of terrestrial vertebrate taxa, including mammoth, giant ground sloth camel, bison, horse, wolf, and rodent terrestrial mammalian taxa (see UCMP confidential fossil locality and specimen data; Attachment H(A)1). The sandstone, silt, and clay lithologies of both geologic units are favorable for exceptional preservation of vertebrate and microvertebrate fossil resources. Stratigraphic occurrences of all localities have been assigned to the Pleistocene Quaternary alluvium (*Qal*) unit.

Occurrences of these stratigraphic units at near-surface depths are quite probable. However, earth-fill and cement materials as well as other existing TPP industrial facilities infrastructure are expected to have either removed or obscured surface exposures of the older *Qal* sediments in some areas.

No other projects with a designated paleontological component are known to have conducted previous field or literature surveys or produced sensitivity maps or reports within or adjacent to the TPP.

Holocene and Post-Holocene-Age Sediments. Sediments of probable Holocene or post-Holocene age that form the thin, surficial cover in the project area are considered to be of limited paleontological interest and thus are considered inconsequential.

8.16.1.4 Method of Assessing Sensitivity

The assessment of paleontological sensitivity of the proposed TPP plant site and associated linear facilities is based both on known paleontological sites near the project area, as well as extrapolated biostratigraphic information derived from rock units in adjacent areas of regional context. The sensitivity of each project component was determined through archival research into the distribution of known fossil localities, fossil-bearing geologic units, exposures of non-fossiliferous rocks, and surface outcrops of the different rock units. Paleontological field surveys were conducted as appropriate. Survey results are provided in Section 8.16.1.6.

Geologic units (mappable rock formations) occurring within a one-half-mile radius of the proposed project area and their interpreted paleontological sensitivity are shown on Figure 8.16-3 and Tables 8.16-2 and 8.16-3 as geologic contacts and specific sensitivity ratings. Known paleontological sites within or near the proposed project area are described in Attachment H(A)1 of the Confidential Technical Appendix H to this Application for Certification (AFC).

Three categories of paleontological potential are used in this report according to CEC standards. Rating categories are considered interpretive and are subject to change as new information is obtained. High potential, moderate potential, and low potential ratings are defined below:

High Potential Rating. Rock units with a high potential for significant paleontological resources are known to have yielded vertebrate fossils within the project area or region. Such a rating does not imply that additional vertebrate fossils would be recovered from this rock unit, but that occurrences have been recorded within the unit. Other factors that are

considered in making a determination pertain to inferred depositional environment and lithology.

Moderate Potential Rating. A moderate potential rating is applied to rock units possessing some degree of potential such as a favorable depositional environment for resource preservation or characteristics of lithologically similar rock units in the region that have yielded vertebrate fossils. All rock units rated as having moderate potential are recommended for field survey and construction monitoring.

Low Potential Rating. A low potential rating is applied to rock units containing lithologies that do not commonly preserve significant fossil resources, such as coarse boulder conglomerates, or welded (ignimbrite) volcanic ash deposits. Igneous rocks, such as the granodiorite outcrops, do not preserve paleontological resources, due to their genesis within a magmatic environment.

8.16.1.5 Field Survey Methods

Mr. David Lawler, project paleontologist, conducted two site visits, on June 9–10 and July 12–14, 2001. The project components were subjected to a pedestrian survey in areas where open exposures afforded the possibility of observing undisturbed native substrate. The project paleontologist walked a systematic pattern of 50-foot-wide transects on the proposed plant site, inspecting soils and exposures such as agricultural plowed land, rodent burrow tailings, and drainages for evidence of fossiliferous materials. Each proposed linear facility was subjected to a pedestrian survey to a distance of 200 feet on each side of the centerline, with approximately 50 feet between transects. Where pavement or elements of the built environment precluded full coverage of the corridor, the survey corridor was narrowed to exposed surfaces. The investigation focused on discerning whether sensitive fossil materials were evident in native soils derived from the *Qal* (Quaternary alluvium), *Tps* (Tertiary, nonmarine sedimentary rocks), or the *Tn* (Neroly Formation) geologic units. See Table 8.16-1 for field survey coverage by project component and field conditions.

Access from landowners was not obtained for a 0.4-mile linear segment of the transmission route. Additionally, a survey was not conducted along the north side of the Tesla

Substation property (see Figure 8.16-3). These areas had already been subject to ground-disturbing activities to install numerous transmission towers. Ground-disturbing activities for the TPP in these areas would be relatively minor. Because all other TPP areas were surveyed and intermittent spot-check monitoring is recommended along the entire proposed transmission route, a pedestrian survey would not be conducted in these two areas prior to construction.

8.16.1.6 Findings

The sensitivity ratings determined through archival research and field survey are shown in Tables 8.16-2 and 8.16-3. It should be noted that sensitivity ratings can change as new paleontological surveys are undertaken and add to the existing database. Identification of vertebrate or microvertebrate sites and materials of scientific significance can elevate a particular rock unit's paleontological rating. All of the project sites were determined to be underlain by Quaternary alluvium, which has moderate to high paleontological sensitivity.

Plant Site. The proposed nine-acre TPP plant site is currently used for agriculture. Minimal topographic relief exists at the site. The Quaternary alluvial sediments (*Qal*) underlying the plant site are assigned a high sensitivity rating. Ground visibility was approximately 95 percent.

Water Supply Line. A new 1,470-foot-long water pipeline would be buried approximately 4 feet underground. The underlying soils are either imported fill or derived from Quaternary alluvium (*Qal*). The sediments underlying the water supply line are assigned a high sensitivity rating. Ground visibility was approximately 95 percent.

Access Road Easement. The proposed easement would be paved and extended across the railroad to access the northwest corner of the plant site. The Quaternary alluvial sediments (*Qal*) underlying the access easement are assigned a high sensitivity rating. Ground visibility was approximately 95 percent.

Transmission Line. A 230-kilovolt (kV) transmission line would connect the proposed TPP plant site to the existing Tesla Substation, located 4.9 miles due west. A new transmission line constructed at the plant site would run southwest for approximately 2.8 miles to connect with an existing transmission line. At this point, the existing transmission line would be

reconducted for approximately 2.1 miles northwest into the Tesla Substation. The new transmission line and reconductoring route is located over agricultural and grasslands. The route crosses Quaternary alluvial sediments (*Qal*), Tertiary nonmarine sedimentary rocks (*Tps*), and the Neroly Formation (*Tn*). These units are assigned a high sensitivity rating. Ground visibility was approximately 95 percent.

8.16.2 Environmental Consequences

Often, only monitoring during excavation can reveal the paleontological content of a formation at a specific impact location. However, for the purposes of this analysis, and in keeping with CEC guidance, the assumption is made that “if the rock units in the geologic formations which are to be disturbed have a high or moderate potential to contain fossil materials, these formations are considered likely to incur impacts” (CEC, 1992).

Excavation activities have the highest potential to unearth and affect paleontological resources. With implementation of the applicant-proposed mitigation measures in Section 8.16.3, no significant impacts on paleontological resources are anticipated. With proper mitigation, the project could result in recordation of new paleontological resources in the project region.

8.16.2.1 Direct Impacts

Plant Site. The formation underlying the proposed plant site (undifferentiated Quaternary alluvial sediments, *Qal/Qu*) is assigned a high sensitivity rating. Paleontological resources could be adversely affected by excavation activity.

Water Supply Line. The proposed water supply line is underlain by *Qal/Qu* sedimentary deposits with a high sensitivity rating. Paleontological resources could be adversely affected by excavation activity.

Access Road Easement. The formation traversed by the proposed road easement (*Qal/Qu*) is assigned a high sensitivity rating. Excavation activity is not anticipated in this location; however, paleontological resources could be adversely affected if road construction required excavation or significant grading.

Transmission Line. The formations traversed by the proposed transmission line, (*Qal/Qu*), (*Tps*) and (*Tn*), are assigned high sensitivity ratings. Paleontological resources could be adversely affected by excavation for pole placement, or any necessary grading.

8.16.2.2 Indirect Impacts

The construction, operation, and maintenance of the proposed TPP is not expected to result in significant indirect impacts to the paleontological resource base. As noted above, paleontological resources typically derive their importance from their physical remains and/or association with geologic strata or other fossils, which would not be subject to indirect effects.

8.16.2.3 Cumulative Impacts

Cumulative impacts on the regional paleontological base by the proposed TPP are limited because implementation of the mitigation measures proposed below for paleontological resources would reduce project-related impacts to a less-than-significant level and would not contribute potential impacts associated with the past, present and reasonably foreseeable projects. Scientifically controlled recovery at significant paleontological sites and/or site avoidance ensures that the information content of significant paleontological resource sites would be retained, and thus, limits the contribution of cumulative impacts of the TPP on the regional paleontological resources base for this project.

8.16.3 Mitigation Measures

The mitigation measures described below would minimize potential impacts of the project on paleontological resources.

8.16.3.1 General Measures

The literature review did not identify any known fossil localities that appear to be affected by the proposed project. The greatest potential for a discovery would occur during new ground-disturbing activities associated with construction. Based on the sensitivity of the underlying formations, the most prudent course would involve paleontological monitoring during

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construction, coupled with the mitigation measures provided below. Specific monitoring recommendations are also provided below.

The following mitigation measures are presented as general measures to be implemented during construction:

PA-1. Designated Paleontological Resource Specialist: Prior to the start of construction, the project owner will provide the CEC with the name and qualifications of its designated paleontological resources specialist and mitigation team members. The paleontologist will be responsible for implementing the following measures and for using qualified personnel for these tasks.

PA-2. Paleontological Resource Monitoring and Mitigation Plan: Prior to the start of project construction, the designated paleontological resource specialist will prepare a draft Paleontological Resource Monitoring and Mitigation Plan to identify general and specific measures to minimize potential impacts to sensitive paleontological resources. Upon approval by the CEC project manager, the paleontological resource specialist will implement the plan.

PA-3. Reduction of Impact through Design Modification: If a paleontological locality is discovered in a direct impact area, an attempt will be made to modify the facility design or placement to avoid the impact. Modifications could include minor rerouting of onsite subsurface utility alignments.

PA-4. Protection During Construction Through Access Restrictions, Construction Restrictions: If a significant paleontological locality is discovered near a direct impact area, the resource will be protected during the construction period through temporary or permanent measures, which may include construction period covenants against vehicular traffic and excavation within the locality, and/or permanent or temporary fencing. Measures of this type will be incorporated into the monitoring and mitigation plan noted above, for review by the CEC prior to construction.

PA-5. Construction Crew Education: Prior to construction, a paleontologist will meet with contractor personnel to provide them with information on the appearance of fossils, research values, and regulatory responsibilities. The crew will also be briefed on procedures to

follow in the event that a potentially significant fossil locality or fossil find is uncovered during construction. The contractor briefing will be videotaped for the education of new personnel, as applicable.

PA-6. Emergency Discovery Procedures: In the event that fossils are uncovered during construction, and a paleontologist is not on site, work in the vicinity will halt and a paleontologist will be called. The paleontologist will examine the find and assess its significance, in accordance with the resource significance criteria discussed above. If the resource is determined to be significant, impacts that cannot be avoided will be mitigated through data recovery or other means, in consultation with the CEC.

PA-7. Paleontological Monitoring, Construction Period Sampling, and Data Recovery: A paleontologist will perform field inspections during initial ground-breaking, and then monitor excavation at facility locations in areas that have been confirmed through field inspection to have high or moderate sensitivity. If excavations bring paleontological materials to the surface, a paleontologist will collect samples for data recovery and analysis. In the event that a major significant find is uncovered, the emergency discovery procedures described above will apply.

PA-8. Paleontological Resources Report: The project proponent will ensure preparation of a Paleontological Resources Report by the designated paleontological resources specialist, if significant fossils are found and recovered during project activity.

8.16.3.2 Site-Specific Measures

Plant Site. Due to the high sensitivity rating of the formation underlying the proposed plant site, there is a high potential for significant paleontological resources to occur below surface. Previously unidentified paleontological resources present on the proposed plant site could be disturbed or destroyed during excavation activity. It is recommended that a paleontologist intermittently spot-check excavation spoils for significant paleontological materials during site grading and excavation activities. Monitoring will be conducted in compliance with the monitoring and mitigation plan developed under Mitigation Measure PA-2, above.

Water Supply Line. Due to the high sensitivity rating of the formation underlying the proposed water supply line, there is a high potential for significant paleontological resources to occur below surface. Previously unidentified paleontological resources in the vicinity of the proposed water supply line could be disturbed or destroyed during excavation activity. It is recommended that a paleontologist intermittently spot-check excavation spoils for significant paleontological materials during site grading and excavation activities. Monitoring will be conducted in compliance with the monitoring and mitigation plan developed under Mitigation Measure PA-2, above.

Access Road Easement. Due to the high sensitivity rating of the formation underlying the proposed access road easement, there is a high potential for significant paleontological resources to occur below surface. Excavation activity is not anticipated in this location, and therefore no monitoring is required. If the project design changes to require excavation activity, it is recommended that a paleontologist intermittently spot-check excavation spoils for significant paleontological materials. If excavation activities were to take place in this location, monitoring would be conducted in compliance with the monitoring and mitigation plan developed under Mitigation Measure PA-2, above.

Transmission Line. Due to the high sensitivity rating of the formation underlying the proposed transmission line, there is a high potential for significant paleontological resources to occur below surface. Previously unidentified paleontological resources in the vicinity of the proposed transmission line could be disturbed or destroyed during excavation activity. It is recommended that a paleontologist intermittently spot-check excavation spoils for significant paleontological materials during site grading and excavation activities. Monitoring will be conducted in compliance with the monitoring and mitigation plan developed under Mitigation Measure PA-2, above.

8.16.4 Applicable Laws, Ordinances, Regulations, and Standards

The implementation of the mitigation measures described above would result in project conformance with the regulations and the intent of the applicable LORS. The applicable LORS for the evaluation and protection of paleontological resources are described below.

Proposed conditions of certification are contained in Appendix K. These conditions are proposed in order to ensure compliance with applicable LORS and/or to reduce potentially significant impacts to less-than-significant levels.

8.16.4.1 Federal Authorities and Administering Agencies

National Environmental Policy Act of 1968 (NEPA), as amended; United States Code (USC) § 4321 4327; 40 Code of Federal Regulations (CFR) 1502.25: NEPA requires analysis of potential environmental impacts to important historic, cultural, and natural aspects of our national heritage. Federal involvement has not yet been identified for this project. A lead federal agency would be identified at the time the project is determined to be a federal undertaking.

1978 Memorandum from Acting Director of the Bureau of Land

Management: This memorandum provides significance criteria for paleontological resources. Since no federal involvement been identified for this project, no lead federal agency has been identified.

8.16.4.2 State Authorities and Administering Agencies

California Environmental Quality Act (CEQA) Section 15064.5; California Public Resources Code Sections 5024, 5024.5, and 21083.2; Title 14, California Code of Regulations Section 15126: CEQA addresses the treatment of significant cultural resources (which under CEQA include fossils, paleontological localities, and formations with a high potential to contain unique fossils or paleontological deposits) that could be affected by the project. CEQA provides a framework for evaluating the significance of the resources, determining project impacts to important resources, and developing a plan to avoid or address adverse effects to these resources. Formal findings of resource significance (for state purposes, eligibility to the California Register of Historic Resources) and assessment of project impacts are made by the lead state regulatory agency. The administering agency for this authority is the CEC.

California Public Resources Code Section 5097.5: This section of the code makes it a misdemeanor to remove, without authorization, archaeological resources or

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paleontological remains from sites located on public lands. Depending on the location, the administering agency for this authority is the San Joaquin County Planning Department or the Alameda County Planning Department.

8.16.4.3 Local Authorities and Administering Agencies

San Joaquin County General Plan: Volume I, Sections G and H, of the General Plan describe efforts to protect paleontological resources in San Joaquin County. The objective is to protect the county's valuable architectural, historical, archaeological, and paleontological resources by promoting identification and inventory, public awareness, reuse, education programs, funding, and restoration. San Joaquin County also follows the provisions of CEQA regarding paleontological resources. The administering agency for this authority is San Joaquin County.

Alameda County: County of Alameda follows the provisions of CEQA regarding paleontological resources. The administering agency for this authority is the County of Alameda.

City of Tracy: The City of Tracy follows the provisions of CEQA regarding paleontological resources. The administering agency for this authority is the City of Tracy.

8.16.4.4 Industry Codes and Standards

No industry codes or standards are applicable to the TPP.

8.16.4.5 Agencies and Agency Contacts

The agencies and agency contacts are provided below.

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Agency	Contact	Telephone Number
Alameda County Planning Department 399 Elmhurst Street Hayward, CA 94544	Bruce Babcock Planner	(510) 670-5400
San Joaquin County Planning Department 1810 E. Hazelton Avenue Stockton, CA 95205	Kerry Sullivan Department Director of Planning	(209) 468-3140
City of Tracy Planning Department 520 Tracy Boulevard. Tracy, CA 95376	Bill Dean Associate Planner	(209) 831-4610

8.16.5 Applicable Permits

No permit requirements have been identified at the federal, state, or local level for the TPP.

8.16.6 References

- Bartow, J.A. 1987. Cenozoic Stratigraphy of the Northern San Joaquin Valley, Central California, In - Structural Geology of the Sacramento Basin, SEPM Geologic Guidebook Series. 117 p.
- Bartow, J.A. 1991. Cenozoic Evolution of the San Joaquin Valley, California U. S. Geol. Surv. Professional Paper 1501.
- California Division of Mines and Geology (CDMG). 1966. San Jose Sheet. Regional Geological Map Series, Scale 1:250,000.
- California Energy Commission (CEC). 1997. Rules of Practice and Procedure and Power Plant Site Certification Regulations. Sacramento.
- Croft, M.G. 1969. Subsurface geology of the Late Tertiary and Quaternary water-bearing deposits of the San Joaquin Valley, California. U. S. Geol. Surv.- Water Resources Div., Open File Report.
- Dibblee, T. W. 1980. Preliminary Geologic Map of the Midway Quadrangle, Alameda and San Joaquin Counties, California. U. S. Geol. Surv., Open File Report 80-535, Scale 1:24,000.

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- Jefferson, G.T. 1991. A Catalogue of Late Quaternary Vertebrates From California: Part One, Nonmarine Lower Vertebrates and Avian Taxa, Natural History Museum of Los Angeles County, Technical Report No. 5, 60 p.
- Lawler, David. 2001. Paleontological Resources –GWF Tracy Peaker Project (TPP), San Joaquin County, California.
- Marchand, D.E. and Allwardt, A.O. 1981. Late Cenozoic Stratigraphic Units, Northeast San Joaquin Valley, California. California U. S. Geol. Surv. Professional Paper 1470, 70p.
- Miller, W.E. 1971. Pleistocene Vertebrates of the Los Angeles Basin and Vicinity (Exclusive of Rancho La Brea). Los Angeles Co. Mus. Nat Hist. Sci. Bull. Vol. 10, No. 4, pp. 47-142.
- Savage, D.E. 1951. Late Cenozoic Vertebrates of the San Francisco Bay Region. Univ. Calif. Public. Geol. Sci., Vol. 28, No. 10, pp.215-314, 51 figs.
- Stirton, R.A. 1939. Late Cenozoic Vertebrates of the San Francisco Bay Region. Univ. Calif. Public. Geol. Sci., Vol. 24, pp.339-410, 95 figs.
- Stirton, R.A. 1951. Prehistoric Land Mammals of the San Francisco Bay Region. In - Geologic Guidebook of the San Francisco Bay Counties, Calif. Div. Mines Geol., Regional Map Series, Bulletin 154, pp.177-186.
- Wolf, R.G. 1971. Paleoecology of a Late Pleistocene (Rancholabrean) Vertebrate Fauna from Rodeo, California, Ph.D. dissertation, University of California, Berkeley, 136 p., unpublished.
- Wolf, R.G. 1973. Hydrodynamic Sorting and Ecology of Late Pleistocene Mammalian Assemblage from California (USA). Paleogeog., Paleoclimatol., Paleoecol., Vol. 13, pp. 91-102.
- Wolf, R.G. 1975. Sampling and Sample Size in Ecological Analyses of Fossil Mammals, Paleobiology, Vol. 1, No. 2, pp. 195-202.

TABLES

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Table 8.16-1
Survey Coverage by Project Component and Field Conditions

Project Component	Field Conditions	Comments
Plant Site	95 percent ground visibility, area spans agricultural lands affording good ground visibility.	Pedestrian field inspection, good ground visibility.
Water Supply Line	95 percent ground visibility, area spans a dirt farm road affording good ground visibility.	Pedestrian field inspection, good ground visibility.
Transmission Line	95 percent ground visibility, area spans open grasslands and some agricultural lands.	Pedestrian field inspection, good ground visibility
Access Road Easement	95 percent ground visibility, area spans a dirt road, and crosses the Union (Southern) Pacific railroad right-of-way.	Pedestrian field inspection, good ground visibility

Table 8.16-2
Geologic Units Within Tracy Peaker Project Area

Symbol	Rock Unit	Age
(<i>Qal</i>) *	Alluvium	Pleistocene
(<i>Tps</i>)	Nonmarine sediments	Late Tertiary
(<i>Tn</i>)	Neroly Formation	Late Tertiary

* Usage of the *Qal* designation on available geologic maps of the San Joaquin County region is highly variable. Geologic units ranging from Quaternary stream, terrace, fluvial, alluvial fan and floodplain deposits, including older alluvium, may be grouped under this designation, particularly where geologic data have been scarce due to agricultural or urban development.

8.16 PALEONTOLOGICAL RESOURCES

Table 8.16-3
Tracy Peaker Project
Paleontological Sensitivity and Geologic Units

Plant Site		
Area	Rock Formation	Sensitivity Rating
9 acres	<i>Qal/Qu</i>	High
Water Supply Line		
Length	Rock Formation	Sensitivity Rating
1,470 feet	<i>Qal/Qu</i>	High
Access Road Easement		
Length	Rock Formation	Sensitivity Rating
3,300 feet	<i>Qal/Qu</i>	High
Transmission Line		
Length	Rock Formations	Sensitivity Rating
4.9 miles	<i>Qal/Qu, Tps, Tn</i>	High

8.16 PALEONTOLOGICAL RESOURCES

Table 8.16-4
LORS Applicable to Paleontological Resources

Jurisdiction	Authority	Requirements/Compliance	Administering Agency	Conformance Section
Federal *	NEPA; 42 USC 4321–4327; 40 CFR § 1502.25.	Analysis of potential environmental impacts on federal lands.	Lead Federal Agency *	Section 8.16-14
	1978 Memorandum from the Associate Director of the Bureau of Land Management	Implements significance criteria for paleontological resources.	Lead Federal Agency *	Section 8.16-14
State	CEQA, § 15064.5; California Public Resources Code §§ 5024, 5024.5, and 21083.2; Title 14, CCR § 15126.4	Formal findings by the project lead agency regarding project-related effects to important paleontological resources.	CEC	Sections 8.16-1, 8.16-2, 8.16-14
	California Public Resource Code § 5097.5	This code section makes it a misdemeanor to remove, without authorization, paleontological remains from sites located on public lands	San Joaquin County Planning Department	Section 8.16-15
Local	San Joaquin County General Plan, Volume I, Sections G and H	Provides policies to protect and identify historical, archaeological, paleontological, and significant architectural resources. The county also follows all provisions of CEQA.	San Joaquin County Planning Department	Section 8.16-15
	Alameda County Planning Department	The county also follows all provisions of CEQA.	Alameda County Planning Department	Section 8.16-15
	City of Tracy Planning Department	The county also follows all provisions of CEQA.	City of Tracy Planning Department	Section 8.16-15
Industry	None applicable.	--	--	Section 8.16-15

This project is not a federal undertaking at this time and is not expected to trigger any of the federal LORS described herein.

FIGURES

Figure 8.16-1

Figure 8.16-2

Figure 8.16-3